CLAIMS

What is claimed is:

1. A method of forming a by-pass capacitor on a multi-level metallization device, said method comprising:

forming a first electrode in a first metal layer of said multi-level metallization device;

depositing a substantially thin dielectric material layer over said first metal layer of said multi-level metallization device; and

forming a second electrode on a second metal layer, wherein said second metal layer is formed over said substantially thin dielectric material layer.

2. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 1, said method further comprising:

patterning said substantially thin dielectric material layer to substantially cover said first electrode; and

adjusting a thickness of said substantially thin dielectric material layer.

3. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 2, wherein a dielectric constant of said substantially thin dielectric material layer is substantially high.

4. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 3 wherein said substantially thin dielectric material

layer includes silicon nitride.

SUB A2

5. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 3, wherein said thickness of said substantially thin dielectric material layer is between 50 to 100 angstroms.

6. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 3, wherein said dielectric constant of said substantially thin dielectric material layer is between 4 and 100.

7. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 1, said method further comprising:

depositing an interlevel dielectric material layer over said substantially thin dielectric material layer; and

etching at least one via, said at least one via adapted to receive said second metal layer.

8. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 7, said method further comprising:

patterning said second metal layer to form said second electrode; and

polishing said second metal layer.

9. The method of forming a by-pass capacitor on a multi-level

metallization device according to claim 1, wherein said forming said first electrode comprises:

SUB A2

etching said first electrode in a dielectric layer of said multi-level metallization device.

10. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 1, wherein said first electrode is formed in a parallel line configuration.

11. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 1, wherein said second electrode is formed in a parallel line configuration.

12. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 1, wherein said substantially thin dielectric material comprises a composite of materials.

13. The method of forming a by-pass capacitor on a multi-level metallization device according to claim 12, wherein said composite of materials includes PZT and platinum.

14. An on-chip by-pass capacitor comprising:

a first electrode formed during a deposition of a first metal layer of a multi-

level deposition device;

a substantially thin dielectric layer configured to be deposited over said first electrode; and

a second electrode formed during a deposition of a second metal layer of said multi-level deposition device, wherein said second electrode is formed over said substantially thin dielectric layer.

15. The on-chip by-pass capacitor according to claim 14, wherein a dielectric constant of said substantially thin dielectric material layer is substantially high.

16. The on-chip by-pass capacitor according to claim 15, wherein said substantially thin dielectric material layer includes silicon nitride.

17. The on-chip by-pass capacitor according to claim 14, wherein said thickness of said substantially thin dielectric material layer is between 50 to 100 angstroms.

18. The on-chip by-pass capacitor according to claim 14, wherein said substantially thin dielectric material comprises a composite of materials.

19. The on-chip by-pass capacitor according to claim 18, wherein said composite of materials includes PZT and platinum.